Volunteer Lake Assessment Program Individual Lake Reports

PARTRIDGE LAKE, LITTLETON, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	896	**Max. Depth (m):**	15.8	**Flushing Rate (yr^{-1}):**	0.6
Surface Area (Ac.):	104	**Mean Depth (m):**	5.8	**P Retention Coef:**	0.71
Shore Length (m):	4,500	**Volume (m^3):**	2,434,000	**Elevation (ft):**	846

TROPHIC CLASSIFICATION

Year	Trophic class
1992	MESOTROPHIC
2006	MESOTROPHIC

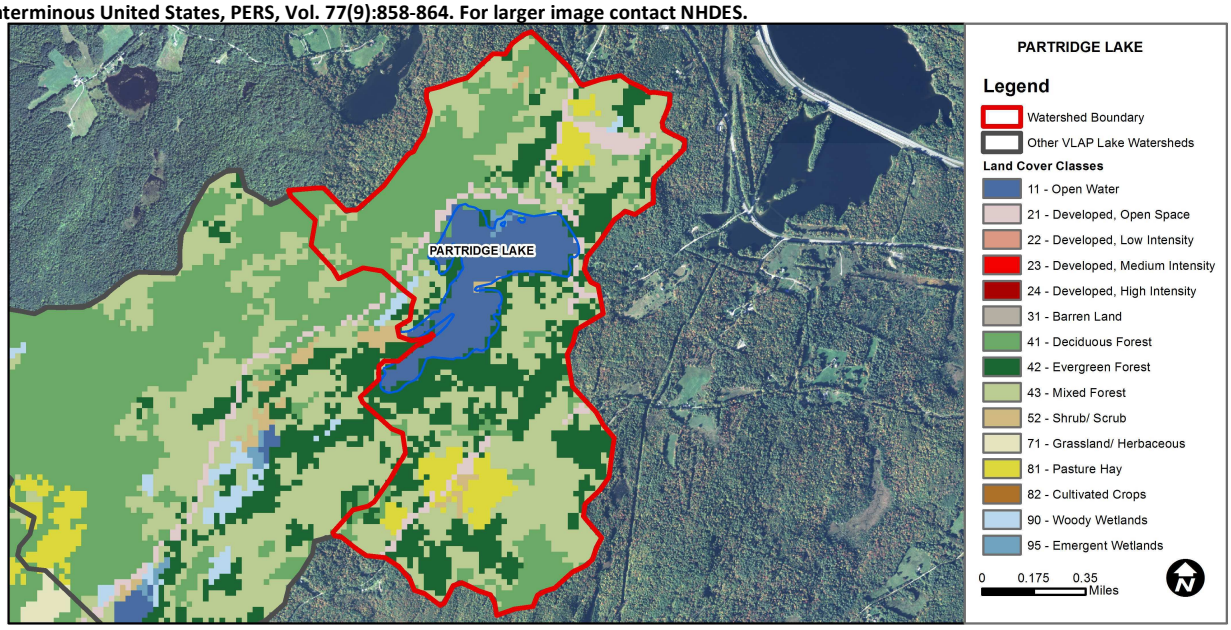
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Very Good	At least 10 samples with 0 exceedances of criteria.
	D.O. (% sat)	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Chlorophyll-a	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
Primary Contact Recreation	E. coli	Encouraging	>2 samples exist that are > 75% of geometric mean criteria, but not enough samples to calculate geomertic mean. No single sample exceedances. More data needed.
	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).
	Chlorophyll-a	Good	At least 10 samples with 1 sample but < 10% of samples exceeding criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.

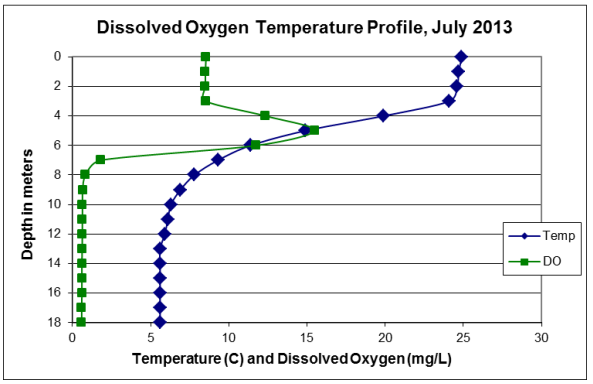


Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	10.3	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	4.41	Deciduous Forest	21.65	Pasture Hay	5.02
Developed-Low Intensity	0	Evergreen Forest	23.15	Cultivated Crops	0
Developed-Medium Intensity	0	Mixed Forest	33.72	Woody Wetlands	0.25
Developed-High Intensity	0	Shrub-Scrub	0.71	Emergent Wetlands	0.25

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
PARTRIDGE LAKE, LITTLETON, NH
2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphic)*

- **CHLOROPHYLL-A:** Chlorophyll levels remained low throughout the summer and the 2013 average was the lowest measured since monitoring began. We hope to see this continue! Historical trend analysis indicates relatively stable chlorophyll with high variability between years.
- **CONDUCTIVITY/CHLORIDE:** Deep spot conductivity was slightly elevated and greater than the state median. Inlet 1 and 10 experienced lower conductivity in June likely due to flushing and higher flow from recent significant storm events. Conductivity levels increased in July and August.
- **E. COLI:** Inlet 1 E. coli was well below state standards for public beaches and surface waters.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus was slightly higher in June following significant storm events, however was still lower than the state median. Hypolimnetic phosphorus was elevated throughout the summer. Inlet 1 phosphorus level was elevated in June following significant storm events, but had returned to lower levels in July and August. Inlets 6 and 10 phosphorus levels were only slightly elevated in June and decreased in July and August. Historical trend analysis indicates significantly decreasing (improving) epilimnetic phosphorus. We hope to see this continue!
- **TRANSPARENCY:** Transparency was stable throughout the summer and greater than the state median. Historical trend analysis indicates relatively stable transparency with moderate variability between years.
- **TURBIDITY:** Epilimnetic and tributary turbidities were above average in June, particularly in Inlet 1. This was likely due to stormwater runoff from significant storm events prior to sampling. Metalimnetic turbidity was slightly elevated in July and August likely due to algal growth. Hypolimnetic turbidity was elevated in June and August either from bottom sediment or organic compounds released from bottom sediments under anoxic conditions.
- **PH:** Deep spot pH was sufficient to support aquatic life however has exceeded critical ranges (6.5 – 8.0 units) in the past.
- **RECOMMENDED ACTIONS:** Watershed management efforts implemented by the lake association have likely resulted in the improved phosphorus and chlorophyll levels. Focus stormwater management efforts on Inlet 1 as significant storm events continue to cause elevated turbidity and phosphorus. Keep up the great work!



Station Name	Alk. mg/l	Chlor-a ug/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m	Turb. ntu	pH
						NVS		
Epilimnion	25.0	2.52	80.5		7	4.43	0.93	7.73
Metalimnion			85.2		11		1.55	7.17
Hypolimnion			95.6		74		5.34	7.11
Inlet 1			98.9	2	25		2.12	7.40
Inlet 10			106.3		9		1.31	7.53
Inlet 6			108.4		13		0.72	7.69
Outlet			80.9		7		0.76	7.74

Table 1. 2013 Average Water Quality Data for PARTRIDGE LAKE

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	Stable	Trend not significant; data highly variable.	Chlorophyll-a	Stable	Trend not significant; data highly variable.
Conductivity	Stable	Trend not significant; data show low variability.	Transparency	Stable	Trend not significant; data moderately variable.
			Phosphorus (epilimnion)	Improving	Data significantly decreasing.